

AMENDMENTS TO THE CLAIMS

1. (currently amended) A composition comprising:
 - A. about 0.05 wt% to about 15 wt% of an irradiated butene-1 polymer material having a melt strength ~~greater than 1~~from 1.5 to 40 cN and a Young's modulus ~~of less than 1000~~from 100 to 900 MPa; and
 - B. about 85 wt% to about 99.95 wt% of a non-irradiated butene-1 polymer material;
wherein the sum of components of A and B is equal to 100 wt%,
the irradiated butene-1 polymer being obtained in a process comprising:
 - (i) irradiating a second non-irradiated butene-1 polymer material in an oxygen-free environment with high energy ionizing radiation at a total radiation dosage of about 5 to about 45 Mrad;
 - (ii) maintaining the product of step (i) in an oxygen-free environment for a period of 1-8 hours; and
 - (iii) heating the product of step (ii) in an oxygen-free environment to a temperature of between 90°C to 110°C, and maintaining that temperature for a period of 2-15 hours.
2. (original) The composition of claim 1 wherein the irradiated butene-1 polymer material is present in an amount from about 0.1 wt% to about 10 wt%.
3. (original) The composition of claim 1 wherein the irradiated butene-1 polymer material is chosen from:
 - (a) a homopolymer of butene-1;
 - (b) copolymers or terpolymers of butene-1 with ethylene, propylene or C₅-C₁₀ alpha-olefins, the comonomer content ranging from about 1 mole % to about 15 mole %;
and;
 - (c) mixtures thereof.
4. (original) The composition of claim 3 wherein the irradiated butene-1 polymer material is a homopolymer of butene-1.
5. (currently amended) An irradiated butene-1 polymer material obtained by ~~irradiating a butene-1 polymer material~~a process comprising:

- (i) irradiating a non-irradiated butene-1 polymer material in an oxygen-free environment with high energy ionizing radiation at a total radiation dosage of about 5 to about 45 Mrad;
- (ii) maintaining the product of step (i) in an oxygen-free environment for a period of 1-8 hours; and
- (iii) heating the product of step (ii) in an oxygen-free environment to a temperature of between 90°C to 110°C, and maintaining that temperature for a period of 2-15 hours,

the non-irradiated butene-1 polymer being chosen from:

- (a) a homopolymer of butene-1;
- (b) copolymers or terpolymers of butene-1 with ethylene, propylene or C₅-C₁₀ alpha-olefins, the comonomer content ranging from about 1 mole % to about 15 mole %; and
- (c) mixtures thereof;

~~with high energy ionizing radiation at a total radiation dosage of about 5 to about 45 Mrad in an environment in which the active oxygen concentration is less than about 15 % by volume, thereby forming an irradiated butene-1 polymer material;~~ wherein the irradiated butene-1 polymer has a melt strength ~~greater than 1~~ from 1.5 to 40 cN and Young's Modulus ~~less than 1000~~ from 100 to 900 MPa.

- 6. (original) The irradiated butene-1 polymer material of claim 5 wherein the total radiation dosage is from about 10 Mrad to about 36 Mrad.
- 7. (original) The irradiated butene-1 polymer material of claim 5 wherein the polymer is a homopolymer of butene-1.
- 8. (currently amended) A composition comprising:
 - C. about 5 wt% to about 95 wt% of an irradiated butene-1 polymer material chosen from:
 - (1) a homopolymer of butene-1;
 - (2) copolymers or terpolymers of butene-1 with ethylene, propylene or C₅-C₁₀ alpha-olefins, the comonomer content ranging from about 1 mole % to about 15 mole %; and
 - (3) mixtures thereof;

having a melt strength ~~greater than 1~~ from 1.5 to 40 cN and a Young's modulus of ~~less than 1000~~ from 100 to 900 MPa; and

D. about 5 wt% to about 95 wt% of a non-irradiated propylene polymer material;
wherein the sum of components of C and D is equal to 100 wt%,

and the irradiated butene-1 polymer is obtained by a process comprising:

- (i) irradiating a second non-irradiated butene-1 polymer material in an oxygen-free environment with high energy ionizing radiation at a total radiation dosage of about 5 to about 45 Mrad;
- (ii) maintaining the product of step (i) in an oxygen-free environment for a period of 1-8 hours; and
- (iii) heating the product of step (ii) in an oxygen-free environment to a temperature of between 90°C to 110°C, and maintaining that temperature for a period of 2-15 hours.

- 9. (original) The composition of claim 8 wherein the irradiated butene-1 polymer material is present in an amount from about 20 wt% to about 90 wt%.
- 10. (original) The composition of claim 8 wherein the irradiated butene-1 polymer material is a homopolymer of butene-1.
- 11. (currently amended) A process for nucleating a non-irradiated butene-1 polymer material comprising:

~~(1) irradiating a butene-1 polymer chosen from:~~

- ~~(a) a homopolymer of butene-1;~~
- ~~(b) copolymers or terpolymers of butene-1 with ethylene, propylene or C₅-C₁₀ alpha-olefins, the comonomer content ranging from about 1 mole % to about 15 mole %; and~~
- ~~(c) mixtures thereof;~~

~~with high energy ionizing radiation at a total radiation dosage of about 5 to about 45 Mrad, in an environment in which the active oxygen concentration is less than about 15 % by volume; wherein the irradiated butene-1 polymer has a melt strength greater than 1 cN and Young's Modulus less than 1000 MPa;~~

- (2) ~~treating the irradiated butene-1 polymer obtained in step (1) to deactivate substantially all free radicals present in the irradiated butene-1 polymer, thereby producing a high melt strength butene-1 polymer;~~
- (3) ~~blending the high melt strength butene-1 polymer obtained in step (2) with a non-irradiated butene-1 polymer material, thereby producing a blended polymer composition; and~~
- (4) ~~compounding the blended polymer composition;~~

~~wherein the crystallization rate of the non-irradiated butene-1 polymer material is increased~~

- (1) blending a high melt strength butene-1 polymer having a melt strength from 1.5 to 40 cN and a Young's modulus from 100 to 900 MPa with the non-irradiated butene-1 polymer material, thereby producing a blended polymer composition; and
- (2) compounding the blended polymer composition, wherein the crystallization rate of the non-irradiated butene-1 polymer material is increased,

the high melt strength butene-1 polymer being obtained by a process comprising:

- (i) irradiating a second non-irradiated butene-1 polymer material in an oxygen-free environment with high energy ionizing radiation at a total radiation dosage of about 5 to about 45 Mrad;
- (ii) maintaining the product of step (i) in an oxygen-free environment for a period of 1-8 hours; and
- (iii) heating the product of step (ii) in an oxygen-free environment to a temperature of between 90°C to 110°C, and maintaining that temperature for a period of 2-15 hours,

wherein the first non-irradiated butene-1 polymer material being chosen from:

- (a) a homopolymer of butene-1,
- (b) copolymers or terpolymers of butene-1 with ethylene, propylene or C₅-C₁₀ alpha-olefins, the comonomer content ranging from about 1 mole % to about 15 mole %, and
- (c) mixtures thereof.

12. (original) The process according to claim 11 wherein the total radiation dose is from about 10 Mrad to about 36 Mrad.

13. (original) The process according to claim 11 wherein the butene-1 polymer material is a homopolymer of butene-1.